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Notes on New England Marine Algæ. V.

BY FRANK S. COLLINS.

Pleurocapsa fuliginosa, Hauck. This species I have found at Marblehead, Mass., forming a very thin reddish or brownish-black coating on rocks near high water mark ; probably it is to be found at similar stations elsewhere, as it occurs in most parts of Europe. The cells, which are from .005 to .02 mm. diam., are usually reddish-brown, but sometimes golden-brown or dull violet ; they are often united in twos, fours, or larger numbers, due to the repeated cell division in all directions ; when the cells cease to divide, the contents change into small round spores. The species is described and figured in Hauck, Deutschlands Meeresalgen, p. 515, fig. 231.

Dermocarpa Schousbœi (Thuret) Bornet. This species I have found at Nahant, Mass., growing on *Rhodochorton Rothii* and *Rhizoclonium riparium ;* it is likely to be found also on other filamentous algæ. The genus *Dermocarpa* differs from *Pleurocapsa* in that the cells of the former do not divide, and therefore are not found united in twos, fours, etc., but though often closely packed, remain individually distinct, each attached to the host plant. In *D. Schousbœi* they are spherical or flattened by mutual compression, and the color is light bluish-green. Figured and described, as *Xenococcus Schousbœi*, in Bornet and Thuret, Notes Algologiques, p. 73, Tab. xxvi.

Dermocarpa prasina (Reinsch) Bornet. Grows quite abundantly in spring on the New England coast, on the older part of the fronds of *Polysiphonia fastigiata.* It is easily distinguished from the preceding species, the cells being cylindrical or club-shaped, .015-.03 × .005-.02 mm., of a deep blue-green color. They are closely packed, forming cushion-like expansions. Reinsch described and figured in Contributiones ad Algologiam et Fungologiam, a number of species of *Sphænosiphon,* a genus which must give place to the older *Dermocarpa;* most of his species it would be practically impossible to distinguish. I do not think our plant can be separated from *D. prasina,* which occurs commonly in Europe on *Catenella opuntia*, and is figured and described in Bornet and Thuret, Notes Algologiques, p. 73, Tab. xxvi.

Goniotrichum ramosum (Thwaites) Hauck. This differs from *G. elegans* (Chauvin) Zan., by having cells which are green in color and longer than broad, instead of reddish, and as long as broad or shorter ; they measure .005-.008 × .008-.02 mm. I I found it at Quincy, Mass., in small quantity among other algæ. Described in Hauck, Meeresalgen Deutschlands, p. 519.

Calothrix Contarenii (Zan.) Born. and Fl. The filaments of this species considerably resemble those of *C. scopulorum,* but they are thinner and straighter, and so erect and closely packed as to resemble those of an *Isactis.* The surface of the frond also resembles *Isactis,* being dark green and smooth, thus easily distinguishing it from *C. pulvinata,* which is equally densely packed, but has a spongy surface. I have found it at Revere Beach, Mass., growing in January and February a little above low water mark, on stones more or less imbedded in the sand.

Calothrix æruginea (Kütz.) Thuret. A species considerably resembling *C. crustacea* in color and habit, but smaller (filaments .009-.01, rarely .012 mm. diam.) and with fewer heterocysts. I found it at Cape Rosier, Maine, July, 1890, growing sparingly on fronds of *Enteromorpha, Cladophora,* etc., in a warm upper tide pool. Figured and described in Bornet and Thuret, Notes Algologiques p. 157, Tab. xxxvii.

Calothrix fasciculata, Ag. The chief distinguishing character of this species is the branching, which in mature plants takes the form of more or less dense, usually secund tufts, near the end of the filaments. I found it at Cape Rosier, Maine, in July, 1889, growing on rocks between tide marks.

Enteromorpha micrococca, Kütz. A small species, externally resembling a stunted form of *E. intestinalis,* but microscopically distinguished by irregularly placed, very small cells (.004-.005 mm. diam.), arranged in no particular order, and by the relatively thick (.018-.02 mm.) cell wall. I found the plant at Mount Desert Island, Maine, in July, 1890, growing on exposed rocks near high water mark, in places where fresh water was running down. It is figured and described in Kützing, Tabulæ Phycologicæ, vol. vi, p. 11, Tab. xxx.

Ulothrix implexa, Kütz. In making collections in the rather brackish water of the Mystic River, at Medford, Mass., in

May, 1887, I found the woodwork of the wharves covered with a coating of algæ, which when examined under the microscope consisted of a bewildering confusion of forms; all of which, however, could be placed under the known species of our coast except one, which I venture to identify as above, on the faith of the description and figure in Hauck, Deutschlands Meeresalgen, fig. 193, and a specimen from the Adriatic, which I owe to Dr. Hauck. The plant is characterised by the rather thin cell wall, the cells rather shorter than their diameter, which is .01-.014 mm., and by the more or less distinct chlorophyll ring in each cell. The color is a yellowish green. I have since found the same species growing near high water mark, on rocky shores at Marblehead and Nahant.

Halothrix lumbricalis (Kütz.) Reinke. I first found this plant at Cohasset, Mass., in May, 1885 ; it grew in company with *Castagnea*, *Punctaria*, and other spring algæ, on floating leaves of *Zostera marina*. Two or three years later I found it similarly at Revere Beach, Mass., and this spring, 1891, I have found it at the latter locality, growing luxuriantly and abundantly on the *Zostera* which grows near low water mark ; it has also been found at Bridgeport, Conn., by Mr. Isaac Holden. It forms a dense fringe, from 3 mm. to 2 cm. in height, and is often hidden from casual observation by other and larger algæ growing with it. The species was first figured and described by Kützing as *Ectocarpus lumbricalis*, the fructification having some external resemblance to that of the subgenus *Pylaiella* of *Ectocarpus*; Hauck transferred it to *Elachista*, which it resembles in its unbranched sterile filaments ; Reinke has recently created a new genus for it, as a result of his studies of its structure and development, which he has published in Algenflora der Westlichen Ostsee, Deutsches Antheils, p. 49. He has given very complete figures in the Atlas Deutscher Meesesalgen, Tab. I.

Ectocarpus Mitchellæ, Harv. This species was described and figured by Harvey in the first part of the Nereis Boreali-Americana, published in 1852. His specimens were collected by Miss A. Mitchell of Nantucket, for whom he named it ; since that time nothing had been heard of it, and the species was beginning to be regarded as rather apocryphal. Among some algæ recently sent me by Miss Laura Jernegan of Edgartown, Mass., I found an *Ectocarpus*, collected by her at Edgartown, which I have little doubt belongs to the long lost species. It is a delicate plant, considerably resembling in color and habit *E. confervoides*, var. *siliculosus*, but the branching is more patent, especially at the tips, where the ramuli are quite densely set, something like *E. fasciculatus*, except that in *E. Mitchellæ* they are more divaricate. The plurilocular sporangia are quite distinct from any other of our species, being elliptic oblong or almost cylindrical, quite sessile, and obtuse, arranged in series on the upper side of the branches. It is, however, not improbable that it may be identical with *E. virescens*, Thuret ; but in that case Thuret's name would have to give way to Harvey's, which has the priority. *E. Sandrianus*, Zan., is nearly allied, but as far as I can judge from figures and herbarium specimens, the two are distinct.

Pylaiella littoralis (L.) Kjellm., var. *fluviatilis*, Hauck. The species is very common and variable, but I have only once met with this variety, which I found in a ditch in Mystic River marshes, Mass. It is softer and more delicate than the type, and is characterized by the very long plurilocular sporangia, little if any wider than the branches on which they grow. In my specimens they sometimes reach a length of a millimeter, and are often terminal, in that case reminding one of *Ectocarpus confervoides*. It is not impossible that *E. longifructus*, Harv. may be properly referred to this variety.

Ascocyclus globosus, Reinke. The genus *Ascocyclus* has been separated by Magnus from *Myrionema*, on account of the formation of the sporangia from the terminal cells of the upright filaments or from their branches, while in *Myrionema* they are borne directly on the basal layer. In *A. globosus* they are formed by transformation of the branches. Colorless jointed hairs, rather larger than the upright filaments, are distributed among the latter, rising from the basal layer. This is one of the larger species of the genus, and forms hemispherical or spherical tufts, large enough to be visible to the naked eye, on various filiform algæ. I have found it at Nahant, Mass., on old fronds of *Chætomorpha Melagonium*. Described in Reinke, Algenflora, etc., p. 46, and figured in the Atlas, Tab. xvii.

Ascocyclus Balticus, Reinke. This species I have found growing on the tips of the fronds of *Laminaria digitata*, at Marblehead, Mass. It is a smaller species than the preceding, forming dots about the size of those of *Myrionema*. The basal layer produces colorless hairs, and erect simple filaments, the upper cells of which are transformed into sporangia, the lower cells remaining unchanged. Described in Reinke, Algenflora, p. 45, and figured in the Atlas, Tab. xv.

Beside the two species just mentioned, the genus *Ascocyclus* will contain one other American species, *A. orbicularis* (J. Ag.) Magnus, (*Myrionema orbiculare*, J. Ag.)

Elachista lubrica, Rupr. Our common *Elachista*, *E. fucicola* (Velley) Fries, varies considerably in appearance, especially on the coast of Maine, where it occurs not only on a number of different species of algæ, but also on woodwork; in July, 1888, I found at St. George's Bay, Maine, an *Elachista* growing rather plentifully on *Halosaccion ramentaceum*, the usual habitat of *E. lubrica*. Dr. F. R. Kjellman, to whom I submitted the various forms of this genus which I had collected, does not consider the plant on *Halosaccion* distinct from our common species, but pronounces a form growing on *Polysiphonia fastigiata* to be the true, arctic *E. lubrica*. It is somewhat softer and paler than *E. fucicola*, and the free filaments are abruptly wedge-shaped at the base, somewhat tapering to the apex; the cells in the basal part one-half to one-third their diameter; the unilocular sporangia longer and narrower than in *E. fucicola*.

Elachista stellaris, var. *Chordæ*, Aresch. A small plant, hardly visible to the naked eye, which I have found once only, when it grew on *Stilophora rhizodes*, collected at Falmouth Mass., in September. The type, which is considerably larger, has not yet been found here, but should be looked for on *Arthrocladia villosa*, on which it occurs in Europe. The variety is sufficiently distinguished from any other of our species by its small size, filaments largest near the base and tapering to the apex, and by the ellipsoid-pyriform sporangia. Figured and described in Areschong, Observationes, Part III. p. 18. Tab. II.

Phuyllophora Traillii, Holmes. This minute species grows on exposed rocky shores, in clefts and "runways" in the rocks.

The fronds seldom reach a height of 15 millimeters, and consist of a terete stipe, sometimes forking, and ending in a rather narrow lamina, simple or once divided; along the margins of the lamina are often numerous ciliæ, in which the cystocarps are formed, usually in the winter months. The color is a bright red, and the fronds usually grow in rather dense patches. I have found it from Cohasset, Mass., to Penobscot Bay, Maine. It is figured and described in Batters' List of the Marine Algæ of Berwick-on-Tweed, p. 114, Tab. xi.

Gymnogongrus Griffithsiæ (Turn.) Martius. I found this plant in September, 1886, forming densely matted tufts scarcely two centimeters high on small pebbles just below low water mark, in an arm of the sea known as the "Salt Pond", Eastham, Mass. It grew in company with *Gelidium crinale*, which it considerably resembles in habit, though easily distinguished on closer examination by its irregular branching. The nemathecia were abundant, forming small wart-like swellings on the branches, mostly at the axils.

In addition to the above mentioned, which I have myself found, the two following species have been found by Dr. W. A. Setchell.

Entocladia Wittrockii, Wille, a plant consisting of slender, irregularly branching green filaments, living in the cell walls of various filamentous algæ, which are more or less distorted by it. The cells are about .009 mm. diam., the end cells slenderer and quite long. Zoospores are formed in single, more or less swollen cells. Dr. Setchell has found it at several points on the coast, and it is probably not uncommon. Figured in Hauck, Deutschlands Meeresalgen, fig. 199.

Pringsheimia scutata, Reinke, a curious green alga forming disk-like expansions on algæ, etc., reminding one somewhat of the fresh water genus *Coleochæte*. The resemblance, however, is merely superficial, the elaborate sexual fructification of *Coleochæte* being entirely wanting, reproduction taking place either by non-copulating macrozoospores, or by copulating microzoospores, the two forms being produced on separate plants. It is described in Reinke, Algenflora, etc., p. 81, and figured in the

Atlas, Tab. xxv., and was found by Dr. Setchell at Waquoit Bay, Mass., on *Zostera marina.*

The above mentioned species and varities, with the exception of *Ectocarpus Mitchellæ,* have never, so far as I know, been reported from the American coast; and as the published descriptions are almost in all foreign languages, and in works not generally accessible, I have added comments which I hope will enable students to recognize them. In the Flora of Middlesex County, Mass., by L. L. Dame and F. S. Collins, I mentioned two other species new to this country, *Monostroma Vahlii,* J. Ag., and *M. latissimum* (Kütz.) Wittr. The locality where the former was found having been destroyed, it is to be hoped some other will be found for it; the latter seems to be not uncommon in marshes near Boston, and has also been found at Bridgeport, Conn., by Mr Isaac Holden. In both places it seems to pass into *M. quaternarium* (Kütz.) Desm.; possibly the two are not distinct species.

Some Plants of Western Pennsylvania.

By Adolph Koenig, M.D.

The following named plants were observed in flower during a halfday's botanical excursion in a narrow valley and adjacent hill-sides, near Wildwood, on the Pittsburg and Western R. R., about fourteen miles north of Pittsburg, July 2nd, 1891.

Anemone Pennsylvanica, L. Rare.
Anemone Virginiana, L. Rather common.
Thalictrum polygamum, Muhl. Common.
Ranunculus acris, L. Common.
Cimicifuga racemosa, (L.) Nutt. Very abundant.
Nasturtium palustre (L.) DC. Apparently the typical form. In waste ground.
Brassica nigra (L.) Koch. Common.
Barbarea vulgaris, R. Br. Common.
Brassica campestris, L. In neglected fields.
Viola sagittata, Ait. Not rare. Inflorescence cleistogamous.
Lychnis Githago (L.) Lam. One specimen only. In open woods, near railroad.
Stellaria longifolia, Muhl. Common.